

Performance Report on Surface Streets in the Seattle Central Business District

Volume 5: Fourth Update - Post Tunnel Closure

January 16, 2007



As required by the Agreement between King County, City of Seattle and Sound Transit, as revised June 24, 2002, for the Downtown Seattle Transit Tunnel and Related Facilities.

Prepared by the Monitor and Maintain Committee, with representation from the following agencies:



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Report Purpose

This report, and subsequent updates, are intended to provide the documentation necessary to satisfy the requirements of Section 10.3 of the “Agreement Regarding the Design, Construction and Operation of the Downtown Seattle Transit Tunnel and Related Facilities”, as executed by the City of Seattle, King County and Sound Transit.

Excerpts from Section 10.3 of this Agreement read as follows:

“It is the Parties’ intent that the Downtown Seattle Traffic and Street Improvements will be sufficient to maintain bus service performance on surface streets in downtown Seattle, during the closure period and after the tunnel is re-opened at performance levels similar to those existing prior to the Closure Period. The Parties hereby establish a Monitor and Maintain Committee (M&M Committee) to be comprised of the designated contacts set forth in Section 20.0. The M&M Committee may be expanded to include participation by other public agencies at the discretion of the Parties. The M&M Committee shall conduct baseline studies of bus travel time and passenger convenience, security, safety and comfort during a measurement period prior to the Closure Period (Baseline Measurement Period.)”

“During the Closure Period and for one year after the Tunnel is reopened, the M&M Committee shall continue to monitor downtown Seattle transportation system performance and make recommendations to the Parties to take actions to maintain said system performance. In performing its functions, the Committee shall be directed to (a) consult with and seek input from suburban stakeholders and (b) report quarterly to the City Council’s Transportation Committee regarding the performance of the downtown transportation system and regarding the Committee’s consultation with various stakeholders.”

The M&M Committee issued its first performance report in September, 2005 just prior to tunnel closure. Volume 1 of the report documented pre-tunnel closure conditions for six specific performance measures. Data for this initial baseline report was collected during the spring and summer of 2005. The six performance measures that are being tracked are as follows:

- Transit travel time
- General purpose traffic operations
- Transit ridership and bus volumes
- Pedestrian activity at bus zones
- Seattle Central Business District (CBD) Customer Surveys
- Transportation Demand Management (TDM) mitigation programs

Each of these six performance studies has been funded as a project within the overall Tunnel Agreement.

Volume 2 of the report was issued January, 2006. It provided the initial assessment of how the tunnel closure plan performed overall, and provided a detailed summary of the contingency planning effort that took place in the first 90 days following tunnel closure. The data sets used for Volume 2 were collected in the fall of 2005, following tunnel closure and extended up to the beginning of the Thanksgiving holidays. This allowed for a better comparison of before and after tunnel closure conditions in the Seattle central business district for non-holiday times.

Volume 3 of this report – issued March 2006 - provided updates on a subset of the six performance measures. Specifically, Volume 3 provided updated information on Measures 1, 3 and 4 and summarized the effect of a set of measures implemented after the release of Volume 2 to address issues identified after tunnel closure. These measures are: transit travel time; transit ridership and bus volumes; and pedestrian activity at bus zones. For Volume 3, transit travel time and bus volumes were derived from the first two weeks in February following the spring 2006 service change. Transit ridership figures were

derived from the fall 2005 service change that ended on February 11, 2006. Pedestrian activity at bus stops was derived from a survey taken in late February/early March.

The Volume 4 report was issued in August 2006 and provided updated information on five of the six performance measures. Data was available for all measures except data related to pedestrian activity at bus zones. Transit travel times for this report were derived from the first seven weeks of the summer 2006 service change. Transit ridership data was taken from the spring 2006 service change. Most of the post-tunnel closure traffic data for this report was collected in May, 2006.

This Volume 5 report contains updates on four of the six performance measures. These include the following: transit travel time, transit ridership and bus volumes, surveys of Seattle central business district customers, and TDM mitigation programs.

The projected schedule for the release of the balance of the report updates has been updated, as shown in Figure 1. With the release of Volume 4, there are now only two volumes of the report yet to be released.

Figure 1. Performance Report Release Dates

	Performance Report Release Dates						
Performance Measure Updates	Complete	Complete	Complete	Complete	Complete	June 07	Jan 08
	Sept 05	Jan 06	March 06	Aug 06	Jan 07		
	Volume 1	Volume 2	Volume 3	Volume 4	Volume 5		
Transit Travel Time	⊙	⊙	⊙	⊙	⊙	⊙	⊙
General Purpose Traffic Operations	⊙	⊙		⊙		⊙	⊙
Transit Ridership and Bus Volumes	⊙	⊙	⊙	⊙	⊙	⊙	⊙
Pedestrian Activity at Bus Zones	⊙	⊙	⊙				⊙
Surveys of CBD customers	⊙			⊙	⊙		⊙
TDM mitigation programs	⊙	⊙		⊙	⊙	⊙	⊙

In June 2007 - just prior to the re-opening of the tunnel - the M&M Committee will issue Volume 6, the sixth installment of this report. The final report, Volume 7, will be issued in January 2008. The release date of the final report has been moved one month later, to provide enough time to process the last formal customer survey, which will be conducted following the re-opening of the tunnel in September 2007. Following the issuance of Volume 7, the monitoring system established by the M&M process will remain in effect through at least September 2008. The data will be available to support additional reports if circumstances dictate they are needed.

Executive Summary on Post Tunnel Closure Conditions through December 2006

Volume 5 of this Report summarizes the post tunnel closure experience in the Seattle Central Business District through December 2006.

The balance of this report provides more detail on each of the evaluation programs that compose the fourth reporting period post tunnel closure. Key highlights from each of the four monitoring programs included in this report are as follows:

Transit Travel Time & Reliability

The first level of analysis for downtown transit travel time is a composite measurement of average time spent in the study area. This value is obtained by identifying the first and last observation of a bus trip in the CBD, regardless of the corridor. Averaging this figure for all trips results in a single value of time spent in the CBD for all observed trips. This value is used as an index, not a measure. This figure includes layover time as well as through-routed trips under one measurement. It will also include many different paths through the CBD with different lengths and travel conditions. The measure becomes meaningful when compared to the same measurement for future conditions to compare the ease of travel for transit through the CBD.

The data used for this reporting period was collected from October 2, 2006 to November 21, 2006. The Travel Time index for this reporting period is **90**, based on an average travel time of 19:46. The baseline Travel Time Index is **100**, representing the value before tunnel closure. The average travel time value at that time was determined to be 21:59, based on bus trips between 4 - 6 pm on weekdays during the month of July, 2005. The current index represents a **10%** decrease in time spent in the downtown core over the pre-tunnel closure baseline, but a **16%** increase over the previous two post-tunnel closure reports, likely due to seasonal impacts. The index from the same period in 2005, immediately after tunnel closure, was **111** so the current measurement still represents a significant improvement from the previous fall measurement. Travel time variability is still consistently good and also much improved over the same period in 2005.

At the corridor level, travel time comparisons were made using baseline data collected before tunnel closure and the three set of post tunnel data available through Volumes 2, Volume 3, Volume 4 and now Volume 5. The results are summarized below:

- Travel time on First Avenue has improved in the southbound direction by 2 to 3 minutes but has gotten 1 minute slower in the northbound direction when compared with the previous report. Overall schedule reliability as measured by the standard deviation is largely unchanged by time of day or direction of travel.
- The average travel time on Second Avenue increased slightly - by about 22 seconds in the morning peak and by about 56 seconds in the evening peak - from the previous report but with no effective change in variation. Travel times and schedule reliability are still better than for baseline conditions.
- For Third Avenue, average travel times improved by about one minute in the southbound direction for both the morning and afternoon peak and in the northbound direction in the peak, when compared to the previous report. Northbound travel in the AM peak was about one minute slower. Trip variation was comparable for both directions for both peak periods. Travel continues to be better in both directions than before tunnel closure.
- For Fourth Avenue S, average travel times increased by about 1 minute during both the morning and afternoon peak. Schedule variation increased slightly in the afternoon.

Travel on Virginia, Olive, and Howell are largely unchanged from the results reported in Volume 4. Stewart is slower by about 1 minute in the PM peak. However, Olive and Stewart still operate better than before tunnel closure. Morning peak on Howell remains slower than before tunnel closure.

In summary, bus travel on surface streets are still generally improved over pre-tunnel closure conditions, but riders of the routes that previously operated in the tunnel continue to experience longer trip times.

Transit Ridership and Bus Volumes

Approximately 95,000 north-south riders crossed the downtown screenline at University Street on weekdays in fall 2004 prior to tunnel closure. As part of a general increase in ridership, this number increased to almost 106,700 weekday riders in spring 2005. Preliminary data from fall 2006 indicate similar loads of 106,200 crossing University Street. However, looking at data from all of the applicable screenlines at the edge of the CBD, loads entering the CBD have increased from 88,000 riders in spring 2005 to 100,300 riders in fall 2006. Similarly, loads leaving the CBD have increased from 90,800 riders to 100,300 riders for the same period.

The bus volumes on surface streets in the Seattle Central Business District have not changed significantly from those reported in Volume 4. They continued to reflect the routing adjustments made post tunnel closure to address operation problems on Stewart Street.

Customer Surveys

King County Metro, acting on behalf of the M&M Committee contracted with the Gilmore Research Group to evaluate the behavior of bus riders and auto drivers before, during, and after tunnel closure. A baseline study of downtown Seattle users was conducted in August 2005, the month before the tunnel closed. The follow-up survey was conducted between June 28 and September 20, 2006 and represents the first formal survey to be conducted since tunnel closure.

Summary conclusions drawn from a comparison of these two surveys are as follows:

- While downtown Seattle users have noticed some changes in how smoothly traffic flows in, through, and out of downtown Seattle, the impacts of the tunnel closure appear to be fairly minimal.
- Several of the elements tested in the survey show slight declines when compared with 2005 results, but most of the differences are not statistically significant. For the most part respondents have remained positive about their overall experiences in downtown Seattle, demonstrating the resiliency of the population to deal with construction impacts in order to effect transportation improvements.
- Bus riders express a lower degree of satisfaction with the amount of personal space at downtown bus stops, but are no more dissatisfied with downtown crowding or personal security when walking around downtown than they were before the tunnel closed.
- The average number of trips to downtown Seattle across all groups and purposes held steady at about 19 per month for 2005 and 2006.
- Bus riders are more satisfied with the elements of bus travel than drivers and carpoolers are with the elements of traveling by car.
- The cost and availability of downtown parking continue to be troublesome for car travelers, but satisfaction with these elements did not change significantly following the tunnel closure.

One final survey of downtown users will be conducted after the tunnel reopens in 2007.

Transportation Demand Management Program

The package of Transportation Demand Management (TDM) programs introduced in support of tunnel closure has successfully expanded participation for these commute options. The results from tunnel closure through November 2006 can be summarized as follows:

- Over 546 Puget Pass holders have signed up for the Home Free Guarantee (HFG) for Individuals program.
- Registration activity at Rideshare Online has increased to more than 1,286 registrations by downtown employees since the Downtown Seattle Transit Tunnel closure.
- There has been a 15% increase in the number of companies that offer telecommuting options since April 2005.
- 22,440 free ride tickets have been distributed as part of the “Plan Your Commute” program and 48% of these tickets have been redeemed.
- The number of merchants participating in the Shop, Dine & Ride program increased to 136.
- Over 150 businesses and 6,700 individuals have joined FlexCar.
- Between June and November, 2006, 663 additional FlexPasses were issued bringing the total to 10,922 since this program was initiated in August 2005.

Measure 1: Transit Travel Time

Monitoring Objectives

The purpose of monitoring transit travel times is to answer the following questions regarding transit travel times in the Seattle downtown core before and after tunnel closure:

- How long are the transit travel times in the Seattle downtown core?
- How consistent are the transit travel times in the Seattle downtown core?
- Where are slowdowns occurring and are there mitigation measures that might address these slowdowns?

Methodology

Transit travel times on surface streets were measured using roadside bus detection equipment at 16 locations in the Seattle downtown core. The locations of these detection points are identified in Figure 2. A description of the equipment and technology can be found in the Methodology section of the baseline tunnel closure report.

The collection of transit travel times began in summer 2005 and will be continuously collected throughout the tunnel closure period. Two levels of data are included in the regular performance reports issued by the Monitor and Maintain Committee:

Level 1: Seattle downtown core summary statistics will be the highest level summary. They consist of aggregated travel times through the study area to define an average transit operating time in the Seattle downtown core on surface streets for the AM peak and the PM peak. This measure will show the amount of time a bus takes on average to traverse the downtown area. Considered over time, this measure will give an overall trend of the increase or decrease in delay on surface streets caused by tunnel closure.

Level 2: Transit Corridor Travel Time summary will track travel time along a discrete set of transit corridors on surface streets in the central business district. The transit corridors included in the monitoring are identified in Figure 2. The data will be categorized by corridor and by time of day (AM Peak and PM Peak). Variability of the data will also be reported to show the consistency of transit travel times.

Figure 2. Transit Travel Time Summary Analysis Corridors and Detection Point Locations



Transit Travel Time Comparison

Data for transit travel time in the Seattle downtown core post tunnel closure is collected continuously. For this report, weekday travel times between October 2, 2006 and November 21, 2006 were used. This period was used to coincide with the fall 2006 service change that went into effect Saturday, September 23rd. Time of day periods, monitoring locations and analysis tiers, as described in the previous section, are the same as the baseline report, except where noted.

In general, transit travel time averages on surface streets for this period were faster than the initial post-closure period results, and overall slightly slower than the previous report. Corridor travel times tended to be slower by approximately one minute in the northbound direction, with mixed changes in average travel time of less than one minute in the southbound direction. Overall, the tunnel closure mitigation measures continue to benefit CBD transit operations, but there are seasonal impacts that create minor variations in average transit travel times.

Seattle Downtown Core Travel Time Summary (Level 1):

The first level of analysis for downtown transit travel time is a composite measurement of average time spent in the study area. This value is obtained by identifying the first and last observation of a bus trip in the downtown core, regardless of the corridor. Averaging this figure for all trips results in a single value of time spent in the downtown core for all observed trips.

This value is used as an index, not a measure. This figure includes layover time as well as through-routed trips under one measurement. It will also include many different paths through the downtown core with different lengths and travel conditions. The measure becomes meaningful when compared to the same measurement in the future to compare the ease of travel for transit through the downtown core.

The baseline Travel Time Index is **100**, representing the value before tunnel closure. The average travel time value at that time was determined to be 21:59, based on bus trips between 4 - 6 pm on weekdays during the months of July and August, 2005. The data used for this reporting period covers the first seven weeks of the fall 2006 service change. The Travel Time index for this reporting period is **90**, based on an average travel time of 19:46, and is slower than travel time indexes of **78** and **77** reported in the Volume 3 and Volume 4 reports for the spring and summer 2006 service changes, respectively. The current index represents a **10%** decrease in time spent in the downtown core over the baseline, but a **16%** increase over the previous two reporting periods, likely due to seasonal impacts. However, the index from the comparable period for the fall 2005 service change - as reported in Volume 2 - was **111**, so this represents a significant improvement from the previous fall measurement. Travel time variability is still consistently good and also much improved over this period in 2005.

Transit Corridor Travel Time Summaries (Level 2)

The four charts in Figure 3 show the average travel times for transit after tunnel closure on selected corridors. The data was collected in October and November 2006 using the monitoring system. The data used is from weekdays only. Each chart shows the average travel time for the direction of travel and time of day indicated. The AM charts include buses observed between 7 – 9 am at the first reader on the corridor being measured. The PM charts cover the time period from 4 – 6 pm.

The average corridor travel times in this report are compared to the comparable statistics for both pre-tunnel closure baseline conditions and for the tunnel closure data reported in successive reports. Corridor travel times should not be compared to each other. Readers were placed to ensure route coverage. Readers were also sited to facilitate communications and insure access to power. As a result, the measured corridors differ in length, number of stops and number of signals, all of which affect travel time but are not related to congestion.

The reader locations that define the boundaries of each of the transit corridors are described below along with a table for each corridor that summarizes the Average Travel Time by time period along with the standard deviation (SD) of the observations in minutes. As a statistical measure, approximately 69% of all observations are within one standard deviation of the average. The SD can be interpreted as approximating the range (+/- 1SD) of the typical travel time that a majority of bus riders will experience on the corridor. There are currently four data points; Volume 1 pre-tunnel baseline, and Volume 2, 3 and 4 post-tunnel closure observations.

- Volume 1: Pre-Tunnel Closure Baseline, Third Quarter 2005
- Volume 2: Post Tunnel Closure, Fourth Quarter 2005
- Volume 3: Post Tunnel Closure, First Quarter 2006
- Volume 4: Post Tunnel Closure, Second Quarter 2006
- Volume 5: Post Tunnel Closure, Fourth Quarter 2006

Travel time summaries for all five data sets are provided in Figures 3 and 4.

Figure 3. Transit Corridor Travel Time Comparisons Before and After Tunnel Closure

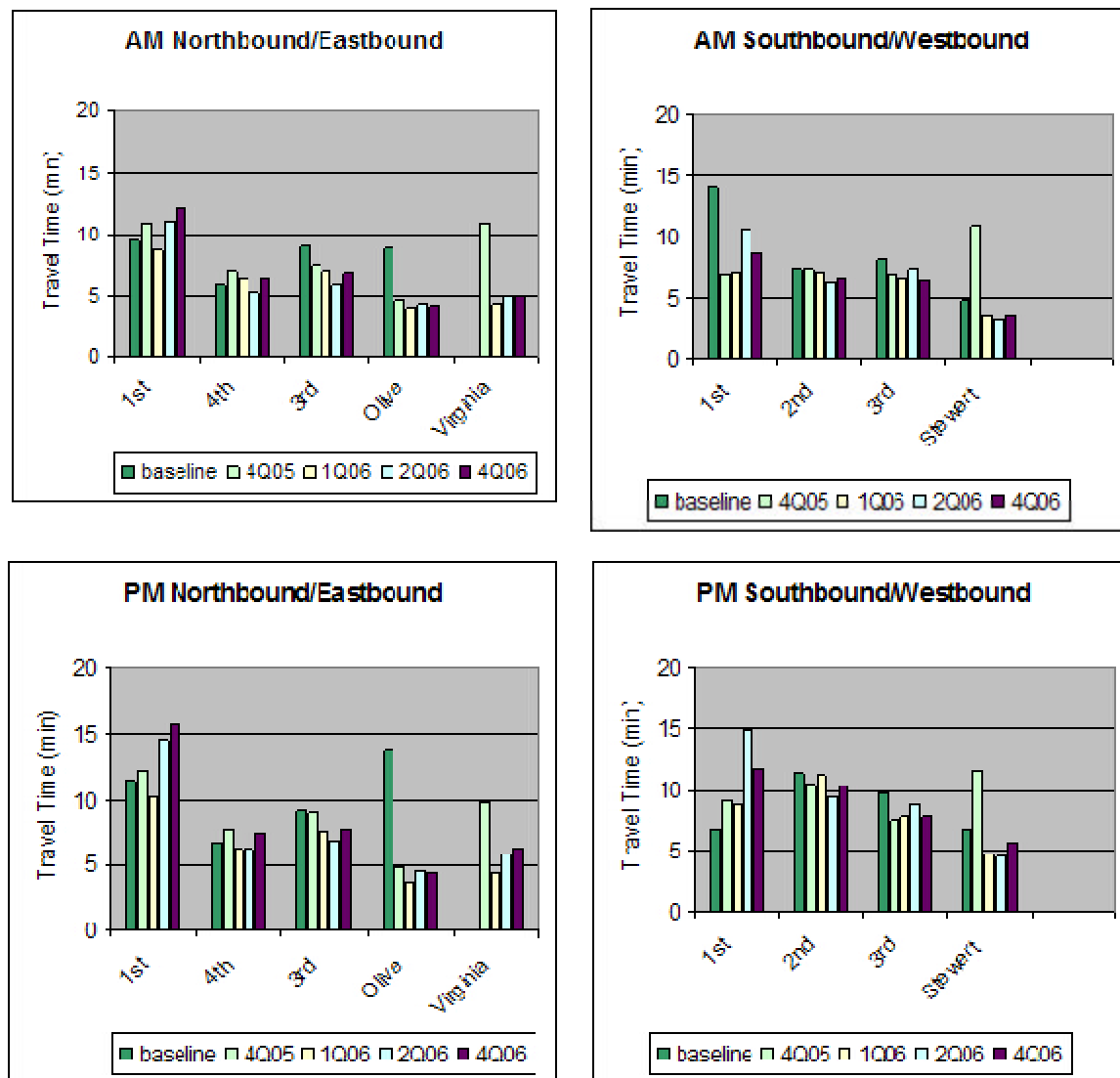


Figure 4A. First Avenue Transit Travel Time and Variation

First Avenue	AM Peak (7 – 9 am)	PM Peak (4 – 6 pm)
Northbound, Royal Brougham to Seneca Street	Travel time: Baseline – 9 min 22 sec (<i>SD: 4.8 min</i>) Volume 2 – 10 min 54 sec (<i>SD: 5.8 min</i>) Volume 3 – 8 min 36 sec (<i>SD: 1.8 min</i>) Volume 4 – 11 min 8 sec (<i>SD: 2.1 min</i>) Volume 5 – 12 min 6 sec (<i>SD: 2 min</i>) Change from Volume 4 : + 58sec	Travel Time: Baseline – 11 min 24 sec (<i>SD: 5.3 min</i>) Volume 2 – 12 min 12 sec (<i>SD: 6.0 min</i>) Volume 3 – 10 min 18 sec (<i>SD: 3 min</i>) Volume 4 – 14 min 34 sec (<i>SD: 4.3 min</i>) Volume 5 – 15 min 41 sec (<i>SD: 4 min</i>) Change from Volume 4 : +1min 7sec
Southbound, Seneca Street to Royal Brougham*	Travel time: Baseline – 14 min (<i>SD: 8.8 min</i>) Volume 2 – 7 min (<i>SD: 5.4 min</i>) Volume 3 – 7 min 8 sec (<i>SD: 1 min</i>) Volume 4 – 10 min 40 sec (<i>SD: 1.8 min</i>) Volume 5 – 8 min 39 sec (<i>SD: 1.5 min</i>) Change from Volume 4 : -2min 1sec	Travel time: Baseline – 6 min 51 sec (<i>SD: 3.9 min</i>) Volume 2 – 9 min 6 sec (<i>SD: 6 min</i>) Volume 3 – 8 min 49 sec (<i>SD: 1.4 min</i>) Volume 4 – 14 min 55 sec (<i>SD: 3 min</i>) Volume 5 – 11 min 42 sec (<i>SD: 3.1 min</i>) Change from Volume 4 : -3min 13sec

First Avenue (Northbound and Southbound) reader locations are Royal Brougham to the south and Stewart Street to the north, with a midpoint at Seneca Street. Average travel time and variation in travel time on First Avenue increased in the northbound direction and decreased in the southbound, following the overall trend for slower northbound travel this period. The relatively low number of observed trips on this corridor tends to generate greater variation from period to period than the other corridors.

Figure 4B. Second Avenue Transit Travel Time and Variation

Second Avenue	AM Peak (7 – 9 am)	PM Peak (4 – 6 pm)
Southbound, Pike Street to S Jackson Street	Travel time: Baseline – 7 min 20 sec (<i>SD: 1.9 min</i>) Volume 2 – 7 min 13 sec (<i>SD: 2.6 min</i>) Volume 3 – 7 min 11 sec (<i>SD: 1.45 min</i>) Volume 4 – 6 min 13 sec (<i>SD: 1.5 min</i>) Volume 5 – 6 min 35 sec (<i>SD: 1.4 min</i>) Change from Volume 4 : +22sec	Travel time: Baseline – 11 min 26 sec (<i>SD: 4.3 min</i>) Volume 2 – 10 min 26 sec (<i>SD: 3.5 min</i>) Volume 3 – 11 min 10 sec (<i>SD: 2.4 min</i>) Volume 4 – 9 min 22 sec (<i>SD: 2.2 min</i>) Volume 5 – 10 min 18 sec (<i>SD: 2.5 min</i>) Change from Volume 4 : +56sec

Second Avenue (Southbound only) reader locations are Pike Street and S Jackson Street with a midpoint at Seneca Street. Second Avenue increased slightly in average travel time with effectively no change in variation. Because this measurement is for the entire length of Second Avenue, it does not capture the sometimes significant delays for transit turning right at Columbia Street to access SR99 southbound.

Figure 4C. Third Avenue Transit Travel Time and Variation

Third Avenue	AM Peak (7 – 9 am)	PM Peak (4 – 6 pm)
Northbound, Yesler Way to Stewart Street	Travel time: Baseline – 9 min (SD: 4.6 min) Volume 2 – 7 min 20 sec (SD: 3.1 min) Volume 3 – 6 min 53 sec (SD: 1.3 min) Volume 4 – 5 min 53 sec (SD: 1.3 min) Volume 5 – 6 min 43 sec (SD: 1.3 min) Change from Volume 4 : +50sec	Travel Time: Baseline – 9 min 6 sec (SD: n/a) Volume 2 – 8 min 57 sec (SD: 3.6 min) Volume 3 – 7 min 41 sec (SD: 1.3 min) Volume 4 – 6 min 53 sec (SD: 1.8 min) Volume 5 – 7 min 47 sec (SD: 1.9 min) Change from Volume 4 : -48sec
Southbound, Stewart Street to Yesler Way	Travel time: Baseline – 8 min 5 sec (SD: 1.3 min) Volume 2 – 6 min 52 sec (SD: 2.8 min) Volume 3 – 6 min 36 sec (SD: 1.6 min) Volume 4 – 7 min 17 sec (SD: 1.5 min) Volume 5 – 6 min 26 sec (SD: 1.4 min) Change from Volume 4 : -51sec	Travel time: Baseline – 9 min 45 sec (SD: 2.5 min) Volume 2 – 7 min 27 sec (SD: 2.9 min) Volume 3 – 7 min 51 sec (SD: 1.5 min) Volume 4 – 8 min 46 sec (SD: 1.8 min) Volume 5 – 7 min 46 sec (SD: 1.6 min) Change from Volume 4 : -1min

Third Avenue (Northbound and Southbound) reader locations are Stewart Street to the north and Yesler Way to the south, with a midpoint at Seneca Street. Average travel times reversed the change from the previous period slowing in the northbound direction and improving in the southbound direction. Average travel times are nearly even with spring measurements from Volume 3. Variation is consistent across the most recent three measurement periods. Travel times and variation in both directions and peak periods are improved over the pre-closure conditions.

Figure 4D. Fourth Avenue Transit Travel Time and Variation

Fourth Avenue	AM Peak (7 – 9 am)	PM Peak (4 – 6 pm)
Northbound, S Jackson Street to Seneca Street	Travel time: Baseline – 5 min 48 sec (SD: 1.2 min) Volume 2 – 6 min 58 sec (SD: 2.8 min) Volume 3 – 6 min 14 sec (SD: 1.35 min) Volume 4 – 5 min 12 sec (SD: 1.2 min) Volume 5 – 6 min 16 sec (SD: 1.3 min) Change from Volume 4 : +1min 4sec	Travel Time: Baseline – 6 min 46 sec (SD: 1.1 min) Volume 2 – 7 min 50 sec (SD: 4 min) Volume 3 – 6 min 15 sec (SD: 2 min) Volume 4 – 6 min 11 sec (SD: 2.2 min) Volume 5 – 7 min 29 sec (SD: 2.8 min) Change from Volume 4 : +1min 18sec

Fourth Avenue (Northbound only) reader locations are Seneca Street to the north and S Jackson Street to the south. Average travel times increased by one minute in both the AM and PM peak. In the AM peak, travel time variation remained the same with average travel times returning to the prior spring averages. In the PM peak, travel time variation increased with average travel times.

Figure 4E. Virginia, Olive Way and Howell Transit Travel Time and Variation

	AM Peak (7 – 9 am)	PM Peak (4 – 6 pm)
Eastbound Virginia, Third Avenue to Ninth Ave	Travel time: Volume 2 – 10 min 39 sec (<i>SD: 5.1 min</i>) Volume 3 – 4 min 23 sec (<i>SD: .9 min</i>) Volume 4 – 4 min 53 sec (<i>SD: .9 min</i>) Volume 5 – 4 min 53 sec (<i>SD: 1.0 min</i>) Change from Volume 4 : none	Travel Time: Volume 2 – 9 min 50 sec (<i>SD: 4.9 min</i>) Volume 3 – 4 min 28 sec (<i>SD: 1 min</i>) Volume 4 – 5 min 48 sec (<i>SD: 2.4 min</i>) Volume 5 – 6 min 11 sec (<i>SD: 2.7 min</i>) Change from Volume 4 : +23sec
Eastbound Olive Way, Third Avenue to Eighth Ave	Travel time: Baseline – 8 min 42 sec (<i>SD: 9.1 min</i>) Volume 2 – 4 min 34 sec (<i>SD: 2.4 min</i>) Volume 3 – 3 min 54 sec (<i>SD: 1 min</i>) Volume 4 – 4 min 19 sec (<i>SD: 1 min</i>) Volume 5 – 4 min 6 sec (<i>SD: 1.1 min</i>) Change from Volume 4: -13sec	Travel Time: Baseline – 13 min 43 sec (<i>SD: 9.7 min</i>) Volume 2 – 4 min 51 sec (<i>SD: 2.5 min</i>) Volume 3 – 3 min 41 sec (<i>SD: .9 min</i>) Volume 4 – 4 min 34 sec (<i>SD: 1.45 min</i>) Volume 5 – 4 min 25 sec (<i>SD: 1.9 min</i>) Change from Volume 4 : -9sec
Eastbound Howell, Eighth Ave to Yale Street	Travel time: Baseline – 2 min 6 sec (<i>SD: 1.4 min</i>) Volume 2 – 3 min 53 sec (<i>SD: 2.4 min</i>) Volume 3 – 3 min 23 sec (<i>SD: 1.6 min</i>) Volume 4 – 3 min 3 sec (<i>SD: 1.25 min</i>) Volume 5 – 3 min 3 sec (<i>SD: 1.3 min</i>) Change from Volume 4 : none	Travel Time: Baseline – 5 min 25 sec (<i>SD: 3.1 min</i>) Volume 2 – 5 min 37 sec (<i>SD: 3.3 min</i>) Volume 3 – 4 min 50 sec (<i>SD: 2.3 min</i>) Volume 4 – 5 min 23 sec (<i>SD: 2.5 min</i>) Volume 5 – 5 min 51 sec (<i>SD: 2.6 min</i>) Change from Volume 4 : +18sec

Virginia Street (Eastbound only) reader locations are Third Avenue at Stewart to the west and Ninth Avenue at Stewart to the east. Virginia Street was not a transit routing before the tunnel closure, so there is no baseline data. Average travel times and variation were virtually unchanged from the previous report.

Olive Way (Eastbound only) reader locations are Third Avenue to the west and Eighth Avenue to the east. Average travel times and variation were virtually unchanged from the previous report.

Howell (Eastbound only): Transit on Howell east of Eighth Avenue was effectively unchanged from the previous reporting period.

Figure 4F. Stewart Street Transit Travel Time and Variation

	AM Peak (7 – 9 am)	PM Peak (4 – 6 pm)
Westbound, Ninth Avenue to Third Avenue	Travel time: Baseline – 4 min 50 sec (<i>SD: 1.9 min</i>) Volume 2 – 10 min 52 sec (<i>SD: 5.2 min</i>) Volume 3 – 3 min 31 sec (<i>SD: 1 min</i>) Volume 4 – 3 min 8 sec (<i>SD: 1.5 min</i>) Volume 5 – 3 min 32 sec (<i>SD: 1.05 min</i>) Change from Volume 3 : +24 sec	Travel Time: Baseline – 6 min 42 sec (<i>SD: 1.5 min</i>) Volume 2 – 11 min 36 sec (<i>SD: 4.9 min</i>) Volume 3 – 4 min 42 sec (<i>SD: 2 min</i>) Volume 4 – 4 min 32 sec (<i>SD: 2.5 min</i>) Volume 5 – 5 min 40 sec (<i>SD: 3.3 min</i>) Change from Volume 3 : +1min 8sec

Stewart Street (Westbound only) reader locations are Third Avenue to the west and Ninth Avenue to the east. Average travel time increased slightly in the AM and by about 1 minute in the PM Peak. More significantly, PM Peak variation increased by almost a minute to 60% of the average travel time. The current average travel times are still significantly better than the same period a year ago, as reported in Volume 2.

Measure 3: Transit Ridership and Bus Volumes

Monitoring Objectives

The purpose of monitoring transit passenger and bus volumes is as follows:

- Provide data on bus volumes by street segment in downtown Seattle
- Measure the average weekday PM peak hour and weekday passenger loads crossing the Seattle CBD north-south screen line
- Provide data as available from Community Transit and Pierce Transit on average ridership crossing the north-south screen line during average PM peak hours and weekdays
- Identify and analyze any substantive changes in ridership or bus volumes for before and after tunnel closure conditions

Methodology

Baseline bus volumes used for this analysis were extracted from HASTUS - the King County Metro scheduling system - using the February 2005 service change. These counts included in-service as well as out of service coaches. A projection of bus volumes on downtown streets for after tunnel closure conditions for September 2006 was also issued with Volume 1, the Baseline Report. These projected bus volumes have subsequently been compared with actual bus volumes for all service changes that have occurred since tunnel closure. Volume 2 provided a comparison with bus volumes as of December 2005 that reflected routing adjustments made to address operating impacts on Stewart Street. Volume 3 provided a comparison with bus volumes from the February 2006 service changes. Volume 4 provided a comparison with bus volumes as of June 2006. Volume 5 now updates this information by providing a comparison with bus volumes as of the September 2006, the most recent service change.

For passenger loads, the Automated Passenger Count (APC) system is the primary source for passenger data for Metro coaches. APC data is collected in a random sample during each signup, downloaded and processed monthly. This data is summarized in a final form at the end of each signup. Preliminary data, based on smaller samples, is available monthly. Metro driver count data is collected on an ad hoc basis when preliminary APC results indicate that observations of trips on a particular route will fall below an adequate sample. Ridership data on Community Transit and Pierce Transit service is generated by the monitor reports supplied by each of these agencies. The ridership data from Community Transit and Pierce Transit is available by signup at the aggregate level.

APC data, supplemented by driver counts and estimates for any non-APC observed trips, was used to estimate pre-tunnel closure Metro ridership volumes crossing the screen line just south of University Street by trip during the PM peak hour and the average weekday. These results were been summarized by street and by direction and have subsequently been used to assess changes in ridership volumes and loads since tunnel closure.

Bus Volumes

The bus volumes that were projected for downtown street segments during tunnel closure, as shown in the Volume 1 Baseline report, are summarized in Figure 5A. The actual post tunnel bus volumes for downtown streets for the September 2006 service change are shown in Figure 5B.

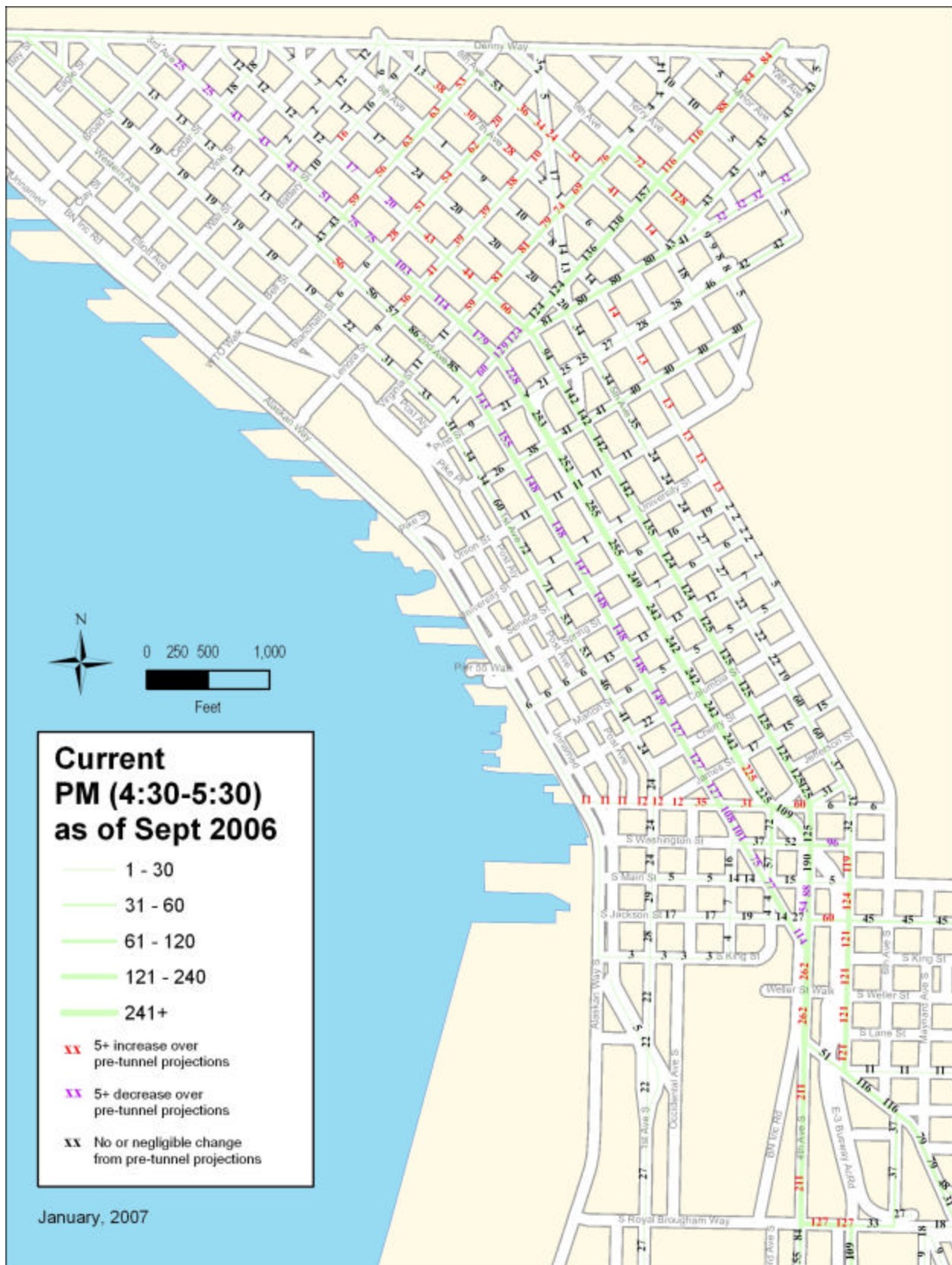
Bus volumes in the CBD during the PM Peak continue to be essentially the same for most links as projected. The PM Peak period used for determining transit volumes is 4:30 to 5:30pm. Slight variations in volumes are due to schedule adjustments that change a trip from being included or excluded from the measured peak hour. The substantive changes for the baseline projection continue to be changes in bus volumes due to the relocation of selected trips from Second Avenue to Third Avenue, and the service adjustments on Stewart Street.

**Projected
PM (4:30-5:30)
Transit Volumes**

- 1 - 30
- 31 - 60
- 61 - 120
- 121 - 240
- 241+

August, 2005

Figure 5B. Actual PM Peak Hour Transit Volumes as of September 2006 Service Change



Transit Ridership Volumes

Prior to tunnel closure, the primary concern regarding ridership was that ridership on transit trips entering the CBD might exceed the available capacity, leading to unacceptable overloads. To address this concern, University Street, approximately in the middle of the CBD, was used as a screenline, and the total volume of riders crossing this screenline, regardless of origin or destination, was measured for baseline (pre-closure) and current (post-closure) conditions.

Approximately 95,000 north-south riders crossed the downtown screenline at University Street on weekdays in fall 2004 before tunnel closure. As part of a general increase in ridership, this number increased to almost 106,700 weekday riders in spring 2005. Preliminary data in fall 2006 indicate similar loads of 106,200 riders crossing University Street. Overall ridership to and from the CBD has increased significantly in this period. The fact that the number of riders crossing the screenline has remained almost constant is probably a result of three factors: (1) some riders leaving downtown who would have crossed the screenline if the tunnel was open are catching their trips after their bus crosses the screenline; (2) some riders entering downtown who would have stayed on their trips past the screenline if the tunnel was open are exiting before they reach University Street, and (3) some riders who would have used the tunnel for cross-CBD trips are not using surface buses as an alternative. In other words, although surface travel times have improved in the CBD since tunnel closure, surface travel times are still slower than tunnel travel times and it is likely that some potential cross-CBD trips are not occurring because they take longer on the surface than they would in the tunnel.

Figure 6 compares preliminary data on fall 2006 ridership at University Street with the baseline spring 2005 loads. Average weekday loads decreased by approximately 0.5 percent. The total load crossing the screenline during the peak hour from 4:30 to 5:30 pm decreased by about 6.1 percent. The greater decline in the peak period indicates that, as mentioned above, a significant number of commuter riders are catching their outbound buses after those coaches cross the screenline.

Figure 6. Passenger Loads at University Street, before and after Tunnel Closure

		Weekday Riders		Change	1-Hr PM Peak Riders		Change
Avenue	Dir	spring 2005	fall 2006		spring 2005	fall 2006	
First	N	9,861	10,416	+5.6%	757	796	+5.2%
	S	6,002	5,711	-4.8%	469	626	+33.5%
Second	S	14,794	14,913	+0.8%	2,465	1,827	-25.9%
Third	N	17,849	27,572	+54.2%	1,478	2,602	+76.0%
	S	17,239	25,387	+47.3%	1,883	3,068	+62.0%
Fourth	N	10,375	17,268	+66.4%	825	1,405	+70.3%
Fifth	S	3,046	4,890	+60.5%	155	250	+61.3%
Tunnel	N	12,991	N.A.		1,188	N.A.	
	S	14,495	N.A.		1,959	N.A.	
Total		106,651	106,156	-0.5%	11,179	10,575	-6.1%

Figure 7 compares preliminary fall 2006 data for standing loads at University Street with the baseline spring 2005 standing loads. The overall incidence of standing loads is approximately at pre-tunnel closure levels on average during the weekday and only slightly higher than pre-closure levels during the peak 1-hr. Average weekday loads greater than seating capacity have increased in incidence on First Avenue northbound, Second Avenue and Fourth Avenue, as did the PM peak hour loads on Third Avenue northbound. Preliminary data indicated one trip with an average load of more than 20 percent over seating capacity on First Avenue southbound during the PM peak hour, as well as a similar increase outside the PM peak hour on First Avenue northbound. These statistics represent a small number of observations of a small number of trips, and are well below the level of concern. The overall incidence of standing loads during the peak 1-hour in fall 2006 was similar to the incidence in spring 2005.

Figure 7. Loads over Seating Capacity at University Street, before and after Tunnel Closure

		Average Loads Greater than Seat Capacity				Average Loads 20% over Seating Capacity			
		% of Weekday Trips		% of Peak 1-Hr Trips		% of Weekday Trips		% of Peak 1-Hr Trips	
Avenue	Dir	spring 05	fall 06	spring 05	fall 06	spring 05	fall 06	spring 05	fall 06
First	N	1.8%	2.0%	7.5%	2.6%	0.0%	0.4%	0.0%	0.0%
	S	1.3%	1.3%	0.0%	0.0%	0.0%	0.3%	0.0%	3.8%
Second	S	0.3%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Third	N	1.2%	1.2%	1.5%	0.9%	0.2%	0.2%	0.0%	0.0%
	S	5.0%	2.5%	4.7%	4.8%	1.3%	0.4%	1.6%	0.0%
Fourth	N	0.5%	0.8%	0.0%	0.0%	0.3%	0.1%	0.0%	0.0%
Fifth	S	0.8%	0.0%	0.0%	0.0%	0.8%	0.0%	0.0%	0.0%
Tunnel	N	0.4%	N.A.	0.0%	N.A.	0.0%	N.A.	0.0%	N.A.
	S	0.2%	N.A.	0.0%	N.A.	0.0%	N.A.	0.0%	N.A.
Total		1.3%	1.3%	1.4%	1.5%	0.3%	0.2%	0.2%	0.2%

Ridership crossing the University Street screenline is similar to pre-closure levels. However, preliminary fall 2006 data from all applicable screenlines at the edges of the CBD indicate that loads leaving the CBD have increased substantially since spring 2005, from 90,800 to 103,000 riders each weekday, including loads on Community Transit and Pierce Transit-operated services. Similarly, preliminary data show that loads entering the CBD had increased from about 88,000 in spring 2005 to about 100,300 in fall 2006. With tunnel reopening, ridership crossing the University Street screenline may rise sharply as passengers take more cross-CBD trips, especially if the current higher speeds (and associated cross-CBD trips) on Third Avenue can also be maintained.

Standing loads have increased since spring 2005, although they are still a small fraction of outbound trips. Figure 8 compares the percent of trips with standing loads leaving downtown at various times of the day. The largest increase, not surprisingly, is in the PM peak, when 7.4 percent of trips leaving the Seattle CBD had standing loads, as compared to 3.4 percent of trips in spring 2005. This increase was spread across a number of routes, including ones not likely to be directly affected by tunnel closure, and is more likely related to the general rise in ridership over the past two years than to tunnel closure.

Figure 8. Percent of Trips Leaving CBD Averaging Standing Loads, before and after Tunnel Closure.

		AM Peak	Midday	PM Peak	Evening	Total
		6-9 AM	9AM-3 PM	3-7 PM	7-11 PM	
Standing Loads	spring 2005	2.4%	2.7%	3.4%	0.3%	2.4%
	fall 2006	5.4%	3.8%	7.4%	2.7%	5.0%
Over 120% Load	spring 2005	0.0%	0.7%	0.5%	0.0%	0.4%
	fall 2006	1.0%	0.9%	1.7%	0.7%	1.1%

Measure 5: Seattle Central Business District (CBD) Customer Surveys

Monitoring Objectives

- Formally assess downtown user perceptions, behavior and satisfaction levels before and during tunnel closure and after the tunnel reopens to transit use in order to assess the effectiveness of the mitigation measures sponsored by the interagency Monitor and Maintain (M & M) team.
- Collect informal feedback from downtown user after tunnel closure to better understand if the mitigation efforts are working well or poorly and to identify key areas for immediate improvement or fine-tuning.

Background

There are two survey instruments that are being employed to gauge the public reaction to tunnel closure.

The first instrument is a formal survey employing the services of a full service research consultant who will survey randomly selected cluster samples downtown of groups targeted for the survey. The type of information collected from bus riders is as follows: purpose of downtown travel; frequency of downtown travel and changes in that frequency; changes in using the bus to travel downtown; overall impression of downtown Seattle; and transit rider satisfaction or dissatisfaction with a number of factors such as travel time by bus through downtown, personal space when waiting at stops, time between buses, on-time performance of buses, location of stops predictability of bus arrivals and departures, and personal security waiting for buses when dark and during the day.

The type of information collected from drivers includes: purpose of downtown travel; frequency of downtown travel and changes in that frequency; changes in using a car to travel to downtown; overall impression of downtown Seattle; and driver satisfaction or dissatisfaction with travel time through downtown by car, convenience of routes through downtown by car, clarity of information (signage, rules) for drivers downtown, ability to park downtown, convenience of parking to destination, and cost of parking.

Information from both drivers and transit users is collected to learn about their general satisfaction or dissatisfaction with the following: being able to walk around downtown without feeling crowded; personal security when walking around downtown; adequacy/clarity of information given to downtown users about the tunnel project; things that are working well and working poorly; performance of those responsible for helping ease disruptions; and recommendations for needed changes or adjustments. Approximately 1,000 downtown users will be surveyed with each formal survey. The survey itself takes 10 – 15 minutes to complete.

The second instrument that has been used to gauge public opinion about tunnel closure are smaller intercept surveys using sample of approximately 200 to 300 downtown users. These intercept surveys provide some qualitative feedback on what downtown constituents are feeling about tunnel closure. Given the difference in methodology and sample size, it should be emphasized that the results of the quick feedback survey cannot be compared with the results of the more formal customer surveys of downtown users described above. They should be viewed as providing information that is similar to the type of information that can be gotten from small focus groups.

King County Metro, acting on behalf of the M&M Committee, contracted with the Gilmore Research Group to conduct these surveys.

Results from Quick Feedback Intercept Surveys

Two quick feedback intercept surveys have been conducted to date. The results of the two intercept surveys were reported in Volume 2 and Volume 4. The surveys were conducted in the fall of 2005

immediately after tunnel closure and in the spring of 2006. Results from the spring 2006 quick feedback were generally consistent with results from fall 2005. The majority of respondents who participated in the 2006 survey felt it was not more difficult to get to downtown, that their buses were on time and that the convenience of their bus stop locations had not changed. However, a sizable minority of respondents still felt these travel elements had gotten worse since the tunnel closed. Respondents were evenly divided on whether it now takes more time to get through downtown and whether downtown is more crowded than before tunnel closure.

Results from Formal Surveys

The formal “before” survey was conducted in August 2005. The results of this survey were reported in the Volume 1 Baseline Report that was issued in September 2005. One of the main conclusions for this survey was that respondents generally had a positive impression of the downtown, that they did not feel crowded when moving around downtown and that they were satisfied with their personal security and safety.

These results will be updated with two more formal surveys. The data collection for the first update was conducted during tunnel closure from June 28 through September 20, 2006. The results of this survey as compared to the earlier baseline are summarized below. A third and final survey will be conducted after the tunnel reopens to transit travel in the fall of 2007.

Methodology

Gilmore Research worked with King County Metro Transit staff to develop a questionnaire suitable for the three survey respondent groups targeted for the study: bus riders, auto travelers who park in downtown surface lots or parking garages, and auto travelers to downtown who park at on-street meters.

Between June 28 and September 20, 2006, Gilmore research staff collected data from three discrete populations who use the downtown area (387 bus riders, 263 auto drivers who parked in downtown lots or garages, and 192 auto drivers who parked at on-street meters). The sampling frame consisted of a complete list of the bus stops, parking garages, parking lots and metered parking blocks in downtown Seattle. Clusters of bus stops, garage/lot locations and parking meter blocks were randomly selected from this list for data collection purposes.

Since the population of downtown users in each of these groups is unknown, it is not possible to combine the data into a proportionately representative “snapshot” of all downtown users. For this reason, even though respondents from the bus rider sample may also travel to downtown by automobile and vice versa, findings from each cluster sample group are analyzed separately.

In 2005, just 41 interviews were conducted with individuals parked at downtown meters. Due to the small sample size, findings from this group were not analyzed in 2005 and are not used for comparison purposes with 2006 data. Comparisons are drawn between 2005 and 2006 for the other two sample types.

Cluster Selection

The sampling frame consisted of a complete listing of the bus stops, garage/lots and metered parking blocks in downtown Seattle. Clusters of 30 bus stops, 30 garages/lots and 20 parking meter blocks were randomly selected from this list for data collection purposes.

Several of the garage/lot cluster locations used in 2005 were under construction and/or refused access and had to be replaced. Replacement garage/lot locations were chosen using the same process described above. Each parking garage/lot was given one chance for random selection for each slot available for parking (i.e., 14 spots = 14 chances, 150 spots = 150 chances). Thus, larger venues had a greater chance to be selected over smaller ones. Each parking lot was only selected once.

Recruitment and Data Collection

All recruiting occurred on weekdays between 2 and 6 PM. Respondents were recruited from June 28 to July 14, 2006 and then again from September 19-20, 2006 for the replacement locations.

Names and telephone numbers of individuals willing to participate in a telephone survey at bus, garage/lot and parking meter locations were collected. Those who did not want to participate in the phone survey were given a postcard with a website address so they could do the survey online. The postcards explained the purpose of the survey, provided the website address and a unique PIN number that would allow respondents to complete the survey online. Table 1 describes how the sampling effort translated into completed interviews for each of the three survey clusters.

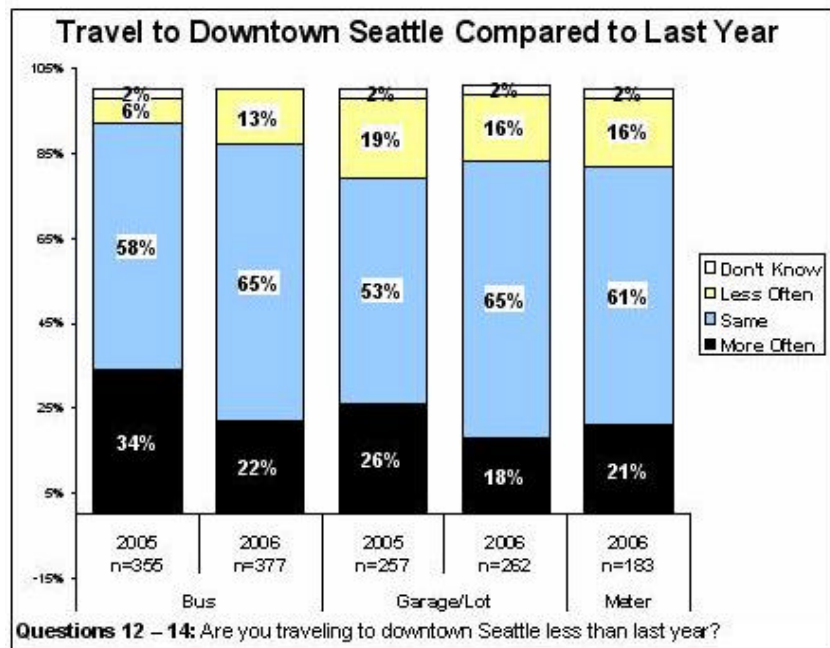
Table 1. 2006 Telephone Survey Sample Disposition						
	Bus Cluster Sample	Percent of Bus Sample	Garage/ Lot Cluster Sample	Percent of Garage/ Lot Sample	Parking Meter Cluster Sample	Parking Meter Cluster Percent
Total Sample Attempted	865	100%	573	100%	428	100%
Disconnected	72	8	34	6	28	7
Business/FAX	4	<1	6	<1	5	1
Wrong Number	98	11	35	6	36	8
Subtotal Non-working	174	20%	75	13%	69	16%
Usable Sample	691	80%	498	87%	359	84%
No answer	29	3	14	2	18	4
Answering machine	177	20	138	24	81	19
Qualified respondent not available	15	2	23	4	10	2
Busy signal	7	1	4	1	8	2
Blocked number	18	2	10	2	13	3
Subtotal No Contact	241	28%	182	32%	130	30%
Total Sample Contacted	450	52%	316	55%	229	54%
Refusals	27	3	25	4	10	2
Terminate/Incomplete	19	2	29	5	2	<1
Subtotal Refusals/Incomplete	46	5%	54	9%	12	3%
Not qualified (misc)	2	<1%	2	<1%	22	5
Quota filled	0	0	0	0	0	0
Language barrier/ hearing problem	12	1	7	1	11	3
Subtotal Not Qualified	14	2%	9	2%	33	8%
Completed Telephone Interviews	385	45%	246	43%	184	43%
Complete Online/Web Interviews	2	---	17	---	8	4
Total Completed Interviews	387	---	263	---	192	---
May not sum to 100% due to rounding.						

Key Findings

Travel to Downtown Seattle Compared to Last Year

More than six in ten respondents from each of the three sample groups reported that they come to downtown Seattle as often now as they did a year ago (65% for Bus Cluster and Garage/Lot Cluster respondents, 61% for Parking Meter Cluster respondents). When compared with findings from 2005, both the Bus and Garage/Lot survey results showed a significant decrease in the percentage who said they come to downtown Seattle more often than they did a year ago.

Figure 9. Travel to Downtown Seattle Compared to Last Year



Travel Time

Overall travel time from the beginning of a trip to the final destination in downtown Seattle differed between Bus and Garage/Lot respondents by less than seven minutes for each trip type and do not differ significantly from findings in 2005.

Bus travelers had significantly longer travel times to work (37 minutes) than those from the Garage/Lot (31 minutes) and Parking Meter Clusters (28 minutes). Bus Cluster respondents had longer travel times than Garage/Lot customers for shopping/medical/errands (30 and 24 minutes respectively) and longer travel times for entertainment than respondents from the Parking Meter Clusters (23 and 19 minutes respectively).

Those who travel downtown on the freeway or the viaduct reported longer travel times on average than those who travel on surface streets across all trip purposes. The difference in average travel time between freeway users and surface street travelers was 3 minutes or less with one exception. Bus Cluster respondents reported a five minute difference in travel time for work trips. Average travel time for the Bus Cluster respondents from the time they exit the freeway increased significantly from 11.3 to 13.5 minutes between 2005 and 2006. No other significant differences in travel time were noted between the two studies.

Table 2. Average Travel Time Through Downtown Seattle (Minutes)

	Bus Respondents Who Travel Downtown		Garage/Lot Respondents Who Travel Downtown		Parking Meter Respondents Who Travel Downtown	
	2005	2006	2005	2006	2005	2006
(Base)						
Work/School	(n=275)	(n=306)	(n=204)	(n=210)		(n=122)
Total	34.9	36.9	32.5	31.1	-	27.9
From freeway exit	11.3	13.5	7.8	7.4	-	8.7
From downtown core	7.7	8.7	6.8	7.3	-	5.6
Shop/Medical Errands	(n=210)	(n=203)	(n=161)	(n=125)		(n=85)
Total	30.2	30.4	25.4	24.1	-	25.7
From freeway exit	10.7	11.5	8.4	7.8	-	9.0
From downtown core	8.3	7.7	7.0	6.9	-	7.0
Entertainment	(n=231)	(n=218)	(n=196)	(n=175)		(n=116)
Total	28.6	31.3	29.9	30.4	-	26.2
From freeway exit	10.1	11.2	9.0	9.3	-	9.6
From downtown core	9.1	7.9	6.9	7.1	-	7.9
Questions 4B, 7B, 10B: How long does it take you to travel from the beginning of your trip to (trip purpose) downtown by (travel mode)?						
Questions 4C, 7C, 10C: (If use freeway) Once you exit the freeway, how long does it take to reach your work or school (minutes)?						
Question 4D, 7D, 10D: (If do not use freeway) Once you reach the downtown core area by (transportation mode), how long does it take to reach your work or school?						

Satisfaction with Bus Travel in Downtown Seattle

In all, 89% of respondents from the Bus Cluster sample, 19% of respondents from the Garage/Lot sample and 18% of those from the Parking Meter Clusters reported riding the bus to downtown Seattle for at least one of the three trip purposes queried in the survey. Respondents who traveled by bus to downtown Seattle were asked a series of questions about their satisfaction with bus travel in and around downtown.

Bus Cluster

More than three-quarters of bus riders from the Bus Cluster Sample were satisfied with:

- Personal security and safety while waiting for the bus during the day (91%)
- The location of your bus stop in downtown (87%)
- The ability of the bus to get you to your downtown destination on time (86%)
- The amount of personal space you have when waiting at downtown bus stops (81%)
- The bus coming when it is supposed to when you are leaving downtown (76%)

One element, *the amount of personal space you have when waiting at downtown bus stops* dropped significantly from 88% satisfied in 2005 to 80% satisfied in 2006. Bus Cluster respondents were the least satisfied with *the amount of time you have to wait in between buses* (32% dissatisfied).

Table 3. Satisfaction with Downtown Bus Service Elements - Bus Cluster respondents who ride the bus to downtown Seattle

(Base)	2005 (n=338)	2006 (n=345)
The amount of time it takes your bus to get through downtown		
Very satisfied	34%	33%
Somewhat satisfied	39	35
Neutral / Depends on time of day	7	6
Somewhat dissatisfied	15	18
Very dissatisfied	5	8
The location of your bus stop in downtown		
Very satisfied	63%	66%
Somewhat satisfied	29	21
Neutral / Depends on time of day	1	<1
Somewhat dissatisfied	4	7
Very dissatisfied	3	6
The amount of personal space you have when waiting at downtown bus stops		
Very satisfied	44%	46%
Somewhat satisfied	40	35
Neutral / Depends on time of day	3	2
Somewhat dissatisfied	8	11
Very dissatisfied	5	7
The amount of time you have to wait in between buses		
Very satisfied	24%	23%
Somewhat satisfied	41	39
Neutral / Depends on time of day	3	5
Somewhat dissatisfied	22	18
Very dissatisfied	10	14
The ability of the bus to get you to your downtown destination on time		
Very satisfied	56%	48%
Somewhat satisfied	32	37
Neutral / Depends on time of day	<1	1
Somewhat dissatisfied	7	8
Very dissatisfied	4	6
The bus coming when it is supposed to when you are leaving downtown		
Very satisfied	33%	36%
Somewhat satisfied	45	40
Neutral / Depends on time of day	2	3
Somewhat dissatisfied	15	13
Very dissatisfied	5	9
Personal security and safety in downtown Seattle while waiting for the bus during the day		
Very satisfied	57%	56%
Somewhat satisfied	33	35
Neutral / Depends on time of day	2	1
Somewhat dissatisfied	5	7
Very dissatisfied	3	2
Personal security and safety in downtown Seattle while waiting for the bus at night		
Very satisfied	18%	18%
Somewhat satisfied	37	38
Neutral / Depends on time of day	17	16
Somewhat dissatisfied	16	17
Very dissatisfied	11	11

Questions 20 - 28: Next are a few questions about your satisfaction with downtown Seattle and downtown bus service. Are you satisfied/dissatisfied with...?

"Refused" respondents not shown. May not sum to 100% due to rounding.

Garage/Lot Cluster

Bus riders from the Garage/Lot Cluster sample gave very similar satisfaction ratings for four of the same five elements:

- Personal security and safety while waiting for the bus during the day (96%)
- The location of your bus stop in downtown (92%)
- The ability of the bus to get you to your downtown destination on time (90%)
- The amount of personal space you have when waiting at downtown bus stops (84%)

Bus riders from the Garage/Lot sample were least satisfied with the bus coming when it is supposed to when you are leaving downtown (34% dissatisfied).

Table 4. Satisfaction with Downtown Bus Service Elements - Garage/Lot respondents who ride the bus to downtown Seattle

	2005 (n=84)	2006 (n=49)
The amount of time it takes your bus to get through downtown		
Very satisfied	33%	37%
Somewhat satisfied	37	31
Neutral / Depends on time of day	5	0
Somewhat dissatisfied	17	18
Very dissatisfied	7	14
The location of your bus stop in downtown		
Very satisfied	69%	67%
Somewhat satisfied	23	25
Neutral / Depends on time of day	2	0
Somewhat dissatisfied	4	2
Very dissatisfied	2	6
The amount of personal space you have when waiting at downtown bus stops		
Very satisfied	43%	31%
Somewhat satisfied	38	53
Neutral / Depends on time of day	10	6
Somewhat dissatisfied	8	6
Very dissatisfied	1	4
The amount of time you have to wait in between buses		
Very satisfied	30%	25%
Somewhat satisfied	27	39
Neutral / Depends on time of day	7	6
Somewhat dissatisfied	25	25
Very dissatisfied	11	4
The ability of the bus to get you to your downtown destination on time		
Very satisfied	56%	55%
Somewhat satisfied	30	35
Neutral / Depends on time of day	4	0
Somewhat dissatisfied	8	8
Very dissatisfied	2	2
The bus coming when it is supposed to when you are leaving downtown		
Very satisfied	33%	41%
Somewhat satisfied	42	25
Neutral / Depends on time of day	1	0
Somewhat dissatisfied	18	22
Very dissatisfied	6	12
Personal security and safety in downtown Seattle while waiting for the bus during the day		
Very satisfied	61%	69%
Somewhat satisfied	29	27
Neutral / Depends on time of day	1	0
Somewhat dissatisfied	4	2
Very dissatisfied	6	2
Personal security and safety in downtown Seattle while waiting for the bus at night		
Very satisfied	17%	25%
Somewhat satisfied	33	45
Neutral / Depends on time of day	16	18
Somewhat dissatisfied	20	6
Very dissatisfied	14	6

Questions 20 - 28: Next are a few questions about your satisfaction with downtown Seattle and downtown bus service. Are you satisfied/dissatisfied with...

"Refused" respondents not shown. May not sum to 100% due to rounding.

Parking Meter Cluster

Bus riders from the Parking Meter Sample also gave high ratings for four of the five elements rated highest by the Bus Cluster Sample:

- Personal security and safety while waiting for the bus during the day (94%)
- The location of your bus stop in downtown (92%)
- The amount of personal space you have when waiting at downtown bus stops (88%)
- The ability of the bus to get you to your downtown destination on time (76%)

Table 5. Satisfaction with Downtown Bus Service Elements - Parking Meter Cluster respondents who ride the bus to downtown Seattle

	2005	2006 (n=34)
The amount of time it takes your bus to get through downtown		
Very satisfied	-	21%
Somewhat satisfied	-	50
Neutral / Depends on time of day	-	-
Somewhat dissatisfied	-	15
Very dissatisfied	-	15
The location of your bus stop in downtown		
Very satisfied	-	65%
Somewhat satisfied	-	27
Neutral / Depends on time of day	-	-
Somewhat dissatisfied	-	9
Very dissatisfied	-	-
The amount of personal space you have when waiting at downtown bus stops		
Very satisfied	-	50%
Somewhat satisfied	-	38
Neutral / Depends on time of day	-	3
Somewhat dissatisfied	-	6
Very dissatisfied	-	3
The amount of time you have to wait in between buses		
Very satisfied	-	32%
Somewhat satisfied	-	38
Neutral / Depends on time of day	-	-
Somewhat dissatisfied	-	27
Very dissatisfied	-	3
The ability of the bus to get you to your downtown destination on time		
Very satisfied	-	35%
Somewhat satisfied	-	41
Neutral / Depends on time of day	-	6
Somewhat dissatisfied	-	15
Very dissatisfied	-	3
The bus coming when it is supposed to when you are leaving downtown		
Very satisfied	-	35%
Somewhat satisfied	-	32
Neutral / Depends on time of day	-	3
Somewhat dissatisfied	-	18
Very dissatisfied	-	12
Personal security and safety in downtown Seattle while waiting for the bus during the day		
Very satisfied	-	62%
Somewhat satisfied	-	32
Neutral / Depends on time of day	-	3
Somewhat dissatisfied	-	-
Very dissatisfied	-	3
Personal security and safety in downtown Seattle while waiting for the bus at night		
Very satisfied	-	24%
Somewhat satisfied	-	38
Neutral / Depends on time of day	-	18
Somewhat dissatisfied	-	18
Very dissatisfied	-	3

Questions 20-21, 23: Next are a few questions about your satisfaction with downtown Seattle and downtown bus service. Are you satisfied/dissatisfied with...

Interpret with caution due to small sample size.

May not sum to 100% due to rounding.

Satisfaction with Car Travel in Downtown Seattle

Eighty-eight percent (88%) of the respondents interviewed from the Garage/Lot Clusters, 83% of those from the Parking Meter Clusters and 38% of those from the Bus Clusters reported traveling to downtown Seattle by car or carpool for at least one of the purposes queried in the survey. These respondents were asked a series of questions about car travel in and around downtown Seattle. Compared to their satisfaction with bus travel elements, respondents from both sample groups were significantly less satisfied with the elements of car travel in downtown Seattle.

Bus Cluster

Fewer than 60% of Bus Cluster respondents who come downtown at least occasionally by car/carpool were satisfied with any of the car travel elements. They were the most satisfied with *the amount of time it takes you by car to get through downtown* (57% very/somewhat satisfied) followed by *the clarity of the informational signs downtown that tell drivers how to get around* (52% satisfied). At least six in ten auto user from the Bus Cluster group indicated they were dissatisfied with the remaining car travel elements.

Table 6. Satisfaction with Car Travel through Downtown - Bus Cluster respondents who sometimes go downtown by car/carpool

(Base)	2005 (n=141)	2006 (n=148)
The amount of time it takes you by car to get through downtown		
Very satisfied	17%	16%
Somewhat satisfied	39	41
Neutral / Depends on time of day	1	4
Somewhat dissatisfied	28	25
Very dissatisfied	15	14
Being able to find parking downtown		
Very satisfied	11%	7%
Somewhat satisfied	25	20
Neutral / Depends on time of day	2	1
Somewhat dissatisfied	26	28
Very dissatisfied	36	43
Being able to find parking that is convenient to your destination in downtown Seattle		
Very satisfied	11%	13%
Somewhat satisfied	34	22
Neutral / Depends on time of day	1	3
Somewhat dissatisfied	27	31
Very dissatisfied	26	30
The cost of parking in downtown Seattle		
Very satisfied	5%	5%
Somewhat satisfied	18	17
Neutral / Depends on time of day	1	1
Somewhat dissatisfied	23	20
Very dissatisfied	53	57
The clarity of informational signs in downtown telling car drivers how to get around downtown		
Very satisfied	15%	18%
Somewhat satisfied	45	35
Neutral / Depends on time of day	9	10
Somewhat dissatisfied	25	18
Very dissatisfied	7	21
Questions 32-36: Next are a few questions about your satisfaction with downtown Seattle. Are you satisfied/dissatisfied with...		
May not sum to 100% due to rounding.		

Garage/Lot Cluster

Fewer than 65% of Garage/Lot respondents were satisfied with any of the car travel elements included in the survey. Car travelers to downtown from this group were most satisfied with *the clarity of the information signs downtown telling drivers how to get around downtown* (61% very/somewhat satisfied) and the least satisfied with *the cost of parking in downtown Seattle* (75% very/somewhat dissatisfied).

Table 7. Satisfaction with Car Travel through Downtown - Garage/Lot respondents who go to downtown Seattle by car/carpool

(Base)	2005 (n=232)	2006 (n=231)
The amount of time it takes you by car to get through downtown		
Very satisfied	15%	11%
Somewhat satisfied	39	35
Neutral / Depends on time of day	4	4
Somewhat dissatisfied	26	28
Very dissatisfied	16	21
Being able to find parking downtown		
Very satisfied	19%	16%
Somewhat satisfied	28	33
Neutral / Depends on time of day	2	21
Somewhat dissatisfied	17	27
Very dissatisfied	34	3
Being able to find parking that is convenient to your destination in downtown Seattle		
Very satisfied	20%	21%
Somewhat satisfied	38	38
Neutral / Depends on time of day	1	3
Somewhat dissatisfied	19	21
Very dissatisfied	22	17
The cost of parking in downtown Seattle		
Very satisfied	7%	4%
Somewhat satisfied	18	20
Neutral / Depends on time of day	1	1
Somewhat dissatisfied	23	27
Very dissatisfied	51	48
The clarity of informational signs in downtown telling car drivers how to get around downtown		
Very satisfied	19%	16%
Somewhat satisfied	36	45
Neutral / Depends on time of day	10	6
Somewhat dissatisfied	21	18
Very dissatisfied	14	15
Questions 32-36: Next are a few questions about your satisfaction with downtown Seattle. Are you satisfied/dissatisfied with...		
May not sum to 100% due to rounding.		

Parking Meter Cluster

Only one car travel element, *clarity of the informational signs downtown telling car drivers how to get around downtown*, was rated satisfactory by at least half of the auto users from the Parking Meter sample (56%). These respondents expressed high levels of dissatisfaction with *being able to find parking downtown* (72% very/somewhat dissatisfied), *the cost of parking in downtown Seattle* (69% very/somewhat dissatisfied) and *being able to find parking that is convenient to your destination in downtown Seattle* (67% very/somewhat dissatisfied).

Table 8. Satisfaction with Car Travel through Downtown by Trip Purpose

Parking Meter Cluster respondents who go to downtown Seattle by car/carpool

	2005	2006 (n=158)
(Base)		
The amount of time it takes you by car to get through downtown		
Very satisfied	-	16 %
Somewhat satisfied	-	29
Neutral/Depends on time of day	-	8
Somewhat dissatisfied	-	24
Very dissatisfied	-	23
Being able to find parking downtown		
Very satisfied	-	6%
Somewhat satisfied	-	19
Neutral/Depends on time of day	-	2
Somewhat dissatisfied	-	30
Very dissatisfied	-	42
Being able to find parking that is convenient to your destination in downtown Seattle		
Very satisfied	-	9%
Somewhat satisfied	-	22
Neutral/Depends on time of day	-	2
Somewhat dissatisfied	-	27
Very dissatisfied	-	40
The cost of parking in downtown Seattle		
Very satisfied	-	6%
Somewhat satisfied	-	21
Neutral/Depends on time of day	-	4
Somewhat dissatisfied	-	29
Very dissatisfied	-	40
The clarity of informational signs downtown telling car drivers how to get around downtown		
Very satisfied	-	20%
Somewhat satisfied	-	36
Neutral/Depends on time of day	-	6
Somewhat dissatisfied	-	18
Very dissatisfied	-	20

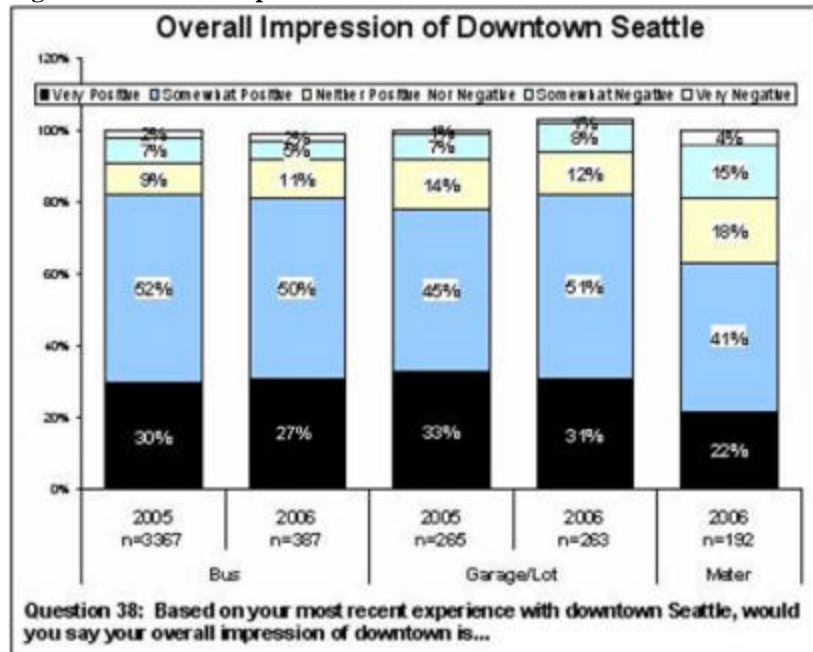
Question 32-36: Next are a few questions about your satisfaction with downtown Seattle. Are you satisfied/dissatisfied with...

May not sum to 100% due to rounding.

Overall Impression of Downtown Seattle

Both Bus and Garage/Lot respondents had a positive impression of downtown Seattle. In all, 81% of Bus respondents and 78% of Garage/Lot respondents said their recent experiences in downtown Seattle left them with a “very” or “somewhat” positive impression. Parking meter respondents had 65% that said their recent experiences in downtown Seattle left them with a “very” or “somewhat” positive impression, significantly lower than both the Bus and Garage/Lot groups. There were no significant differences in overall impressions between 2005 and 2006 survey findings.

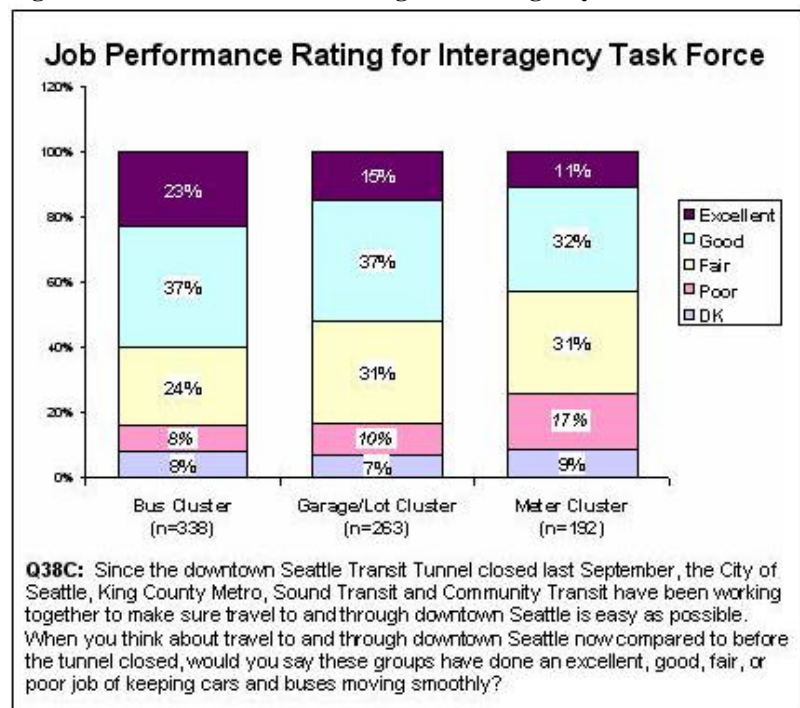
Figure 10. Overall Impression of Downtown Seattle



Interagency Task Force Job Performance Rating

A new question in 2006 asked respondents how good a job they thought the inter-agency task force working on traffic flow in downtown Seattle was doing since the tunnel closed. Respondents from the Bus Cluster sample were significantly more likely than those from the Parking Meter sample to say the task force was doing an “excellent” or “good” job, while respondents from the Garage/Lot Clusters fell somewhere in between (60%, 43% and 52% respectively).

Figure 11. Job Performance Rating for Interagency Task Force



Conclusions

While downtown Seattle users have noticed some changes in how smoothly traffic flows in, through, and out of downtown Seattle, the impacts of the tunnel closure appear to be fairly minimal. Several of the elements tested in the survey show slight declines compared with 2005, but most of the differences are not statistically significant. For the most part respondents have remained positive about their overall experiences in downtown Seattle, demonstrating the resiliency of the population and its ability to weather setbacks in order to effect transportation improvements.

Bus riders express a lower degree of satisfaction with the amount of personal space at downtown bus stops, but are no more dissatisfied with downtown crowding or personal security when walking around downtown than they were before the tunnel closed. The average number of trips to downtown Seattle across all groups and purposes held steady at about 19 per month for 2005 and 2006.

Bus riders are more satisfied with the elements of bus travel than drivers and carpoolers are with the elements of traveling by car. The cost and availability of downtown parking continue to be troublesome for car travelers, but satisfaction with these elements did not change significantly following the tunnel closure.

Measure 6: Transportation Demand Management Program

Goals and Objectives

The Transportation Demand Management (TDM) program was designed to retain and increase users of alternative modes of transportation (transit, walking, bicycling, rideshare) during the Downtown Seattle Transit Tunnel closure period. Programs are targeted towards commuters working within the Seattle Central Business District (CBD) and the International District.* A multi-pronged approach was undertaken to achieve this goal:

- Enhancement of programs and products to retain existing users
- Broadening the scope of programs and products to attract new users (individuals and small employers)
- Creating a supportive operating environment necessary to promote alternative modes of transportation
- Educational activities to promote the current programs and assist commuters in making travel decisions
- Incentive programs to reward commuters for trying alternative methods or committing to major changes

** Commuters must work within the following downtown boundary to participate: south of Stewart Street, north of Dearborn Street, west of I-5, and east of Elliot Bay.*

Primary activities that occurred in this reporting period included targeted outreach to both small and large employers on pre-tax transit pass purchase programs and Flexcar membership. There was also targeted outreach at major commercial buildings, employers, and point of sale outlets aimed to provide individuals with both the incentives and the knowledge to use current programs.

Data Collection

Each TDM program is being monitored and tracked to determine its attractiveness and effectiveness. The data is being collected on a month-to-month basis and includes number of people served and number of people using a particular TDM option. As a way of measuring continued progress, the numbers from the third period are compared to the current program totals.

Summary

The package of TDM programs introduced in support of tunnel closure has successfully expanded participation in commute options. Some highlights include:

- Over 6700 individuals and 150 businesses have joined Flexcar since the beginning of tunnel closure mitigation efforts in August 2005.
- 135 individual Puget Pass holders signed up for the Home Free Guarantee (HFG) in the third period, bringing the total close to 550 since program initiation.
- Registration activity at Rideshare Online continues at an accelerated pace, with 406 new registrants this period and close to 1300 total registrations by downtown employees since DSTT closure.
- The number of merchants participating in the second edition of the Shop, Dine & Ride book increased to 136.
- The FlexPass program has experienced a 4% increase in employer contracts, and a 6% increase in FlexPass sales from the second period totals.
- 33 individuals, representing 20 companies, participated in the most recent Pre-tax class. Of those, 13 have started Pre-tax programs.

Table 9. Reporting Period Data (June - November 2006)

Existing Programs with Enhancements	# of New Participants (June-November 2006)	Current Total (since initiation of TDM program in Aug 2005)
Puget Pass Consignment		
# of Accounts	2	60
# of Passes	913	5,302
FlexPass*		
# of Contracts	8	194
# of Passes	663	10,922
Rideshare (Carpool, Vanpool, VanShare)		
# of VanPools and VanShares	1	51
# of VanPool Users*** (riders)	31	89
Rideshare Online		
# of Registrants	406	1286
Flexcar		
# of Business Contracts	34	151
# of Individual Contracts	1919	6774
New Programs to Increase and Retain Users of Alternative Travel Modes	# of New Participants (June-November 2006)	Current Total (since initiation of TDM program in Aug 2005)
Home Free Guarantee (HFG) for Individuals		
# of Accounts^	135	546
# of Rides (usage)	3	16
Plan Your Commute		
# of Participants	103	1476
# of Free Ride Tickets Distributed	480	22,440
% of Tickets Redeemed	+5%	48%
Telecommuting		
# of Workshops	0	2
% of companies that allow telework	+3%	15%
New Programs to Support the Operating Environment of Alternative Modes	# of New Participants (June-November 2006)	Total (since initiation of TDM program in Aug 2005)
Bicycling		
# of 3-hour Workshop Participants	N/A^^	77^^
Shop Dine & Ride		
# of Retail Participants	16	136

^ - 2006 numbers (through November 2006)

^^ - Numbers were not provided for the current reporting period. Total numbers reflect activity through May 2006.

* - FlexPass and FlexPass + CT added together

** - Rideshare totals (accounts and users) from STAR Carpools, Metro Vanpools, Community Transit Vanpools, other Vanpools, and Metro VanShare. Carpools do not include City of Seattle registrations.

*** - Estimates based on 7 riders per Community Transit vanpool

Program Notes

Puget Pass Consignment:

There were two new Puget Pass Home Free Guarantee (HFG) consignment accounts created in the past six months. With 9 rides taken during the third period, (HFG) for consignment usage was slightly below the second period total of fourteen. Considering that the number of consignment pass holders totals more than 5,000, the usage represents less than 1% of total pass holders. This is well within the normal usage rates for the overall HFG program.

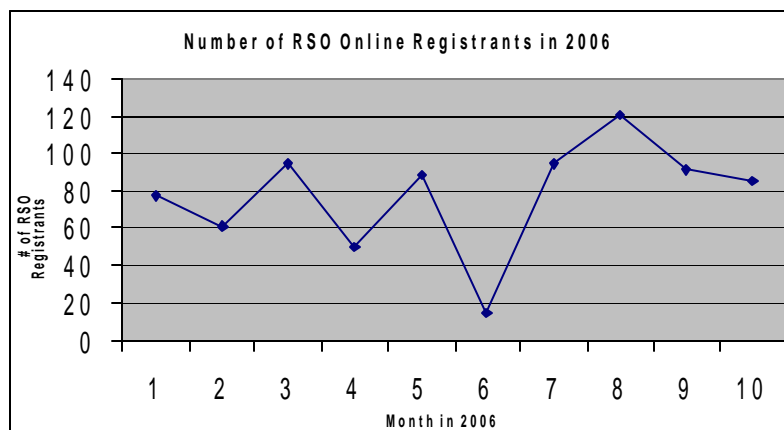
FlexPass

The number of Area FlexPass agreements continues to increase. Currently there are a total of 194 total FlexPass contracts, including 40 contracts, or 20.6% of the total, that contain the Community Transit option. These Community Transit-option contracts account for 3,478 passes, or 32% of the total 10,922 downtown Area FlexPasses.

Rideshare

There are 31 new VanPool users since June 2006. Meanwhile, Rideshare Online has seen a significant increase in online registration, with 406 new registrants in the past six months.

Figure 12. Number of RSO Online Registrants in 2006



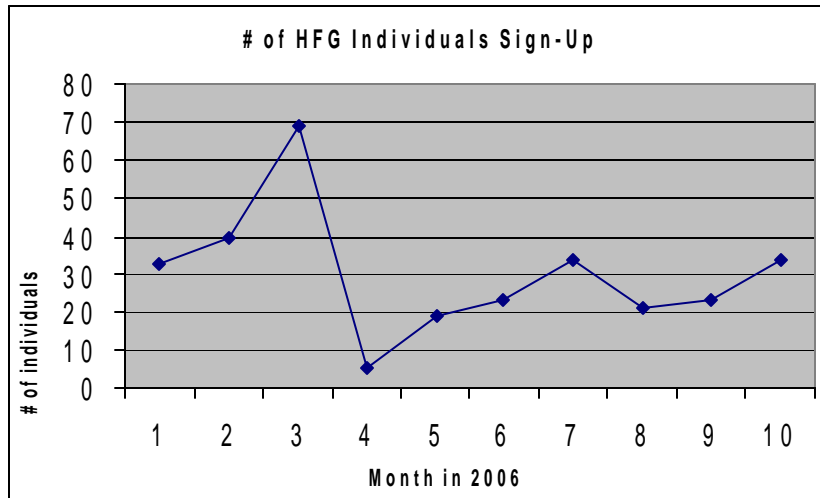
Flexcar

FlexCar numbers have increased dramatically. In the past six months, 34 new businesses and 1,919 individuals have joined Flexcar.

Home Free Guarantee (HFG) for Individuals

Monthly Puget Pass holders who work in downtown are eligible for Metro's HFG program at no cost. An additional 135 downtown Seattle commuters have signed up for the benefit in the past six months.

Figure 13. Number of HFG Individuals Sign-Up



Plan Your Commute (PYC)

The Plan Your Commute sessions are offered every Wednesday at the Transportation Connection, as well as at targeted transportation fairs and other events. Since June 2006, 103 participants have learned about commute options from personal rider information officers at these mobile Plan Your Commute stations. Along with the information, over 480 King County Metro free ride tickets were distributed, with a redemption rate of between 29-47% each month.

Shopper Incentives

One hundred thirty-six retail service providers participated in the second phase of the Shop, Dine and Ride program, which encourages commuters and shoppers to continue to visit downtown Seattle throughout the tunnel closure period.